

Abstract Of The Disclosure

A graphics system including a custom graphics and audio processor produces exciting 2D and 3D graphics and surround sound. The system includes a graphics and audio processor including a 3D graphics pipeline and an audio digital signal processor. The system achieves highly efficient full-scene anti-aliasing by implementing a programmable-location super-sampling arrangement and using a selectable-weight vertical-pixel support area blending filter. For a 2X2 pixel group (quad), the locations of three samples within each super-sampled pixel are individually selectable. A twelve-bit multi-sample coverage mask is used to determine which of twelve samples within a pixel quad are enabled based on the portions of each pixel occupied by a primitive fragment and any pre-computed z-buffering. Each super-sampled pixel is filtered during a copy-out operation from a local memory to an external frame buffer using a pixel blending filter arrangement that combines seven samples from three vertically arranged pixels. Three samples are taken from the current pixel, two samples are taken from a pixel immediately above the current pixel and two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel. The weight coefficients used in the blending filter are also individually programmable. De-flickering of thin one-pixel tall horizontal lines for interlaced video displays is also accomplished by using the pixel blending filter to blend color samples from pixels in alternate scan lines.